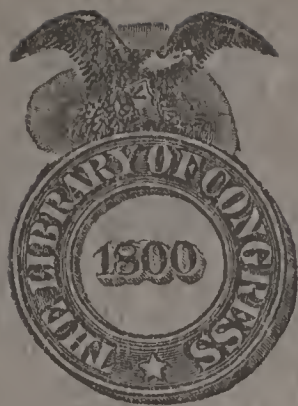


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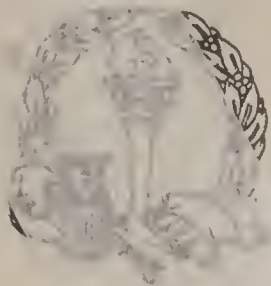
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REORGANIZATION OF THE GOVERNMENT DEPARTMENTS

7
A. E. A. Plan for Grouping Engi-
neering Activities to Effect Economies
and Transfer to the Chief of
Engineers of the U. S. Army



AMERICAN ASSOCIATION OF ENGINEERS

63 EAST ADAMS STREET, CHICAGO

AUGUST, 1921

Chicago, Illinois,

August 20, 1921.

As the result of a strong movement to ~~effect~~ economy in the cost of operating the Government, Congress has by ~~joint~~ resolutions created a committee to investigate and recommend reorganization of the administrative branch of the Government. The President of the United States is personally represented on this committee by Mr. Walter F. Brown of Toledo, Ohio. The committee has been working quietly and persistently since early last May and will probably make a report in September.

The following paper is offered with the view of its usefulness in considering the problem of reorganization. The question is one meriting the careful attention of every citizen who is interested in reducing taxation. When the question is taken up by Congress this fall, there will be lively discussions and an awakened interest on the part of the public.

The matter of reorganizing the administrative branch of the Government is necessarily a technical problem, but it is further complicated by selfish interests which seek to continue the old order.

In this paper are presented some constructive suggestions which deserve close study by those who will be concerned in working out the problem.

This paper which has been prepared by some of our members will serve as an answer to the circular recently issued by the Chief of Engineers of the United States Army to his officers, giving his reasons for opposing the reorganization of the engineering activities of the Government. In order to avoid the misunderstanding which may result from statements in the circular it is felt that the arguments of the Chief of Engineers should be answered.

AMERICAN ASSOCIATION OF ENGINEERS

By Transfer
OCT 8 1921

THE Corps of Engineers of the Army realizes that were it once to lose its river and harbor and other civil works, it would never regain them. In the past, from time to time, it has lost works originally assigned to it. The Coast Survey, The National Parks, the Survey West of the 100th Meridian, the more important part of our lighthouse construction, etc. It is noteworthy that such civil work once taken away from the Corps of Engineers of the Army is never returned to it. This shows that Congress and the people are better satisfied with the results obtained by the other organizations to which such works have been transferred.

The Corps of Engineers of the Army, therefore, is making a desperate attempt to hold the civil works which it still has,—it realizes that the loss of these works would leave it with nothing to do other than its regular Army duties, and fears that its personnel would ultimately be reduced both in numbers and in rank until it balanced properly with the other branches of the Army. This outcome would be logical and natural. It would noticeably reduce the cost of the Army and would in itself more than compensate for the supervision of the works by another agency.

It is natural, of course, that those at the head of the Army engineers should make every attempt to prevent the loss of these civil works, and that they should lose sight of the resultant benefits to the country as a whole. Their arguments are inevitably one-sided. It is impossible for people with so strong a personal interest to present arguments which are free from prejudice and which are judicial in character. This "state of mind" is evident in the memorandum regarding the proposed Department of Public Works issued by the Chief of Engineers of the Army on May 3, 1921.

Comment on this memorandum will first be given and thereafter a showing will be made of certain features connected with the control of civil works by the Army engineers which are decidedly disadvantageous to these works and to the country, and finally, the essential features which the organization of a Department of Public Works should have will be described and explained. Many of the objections of the Chief of Engineers to formerly proposed legislation on this subject do not apply to the plan now presented.

PUBLIC WORKS NOT INCIDENTAL TO PRIMARY FUNCTIONS OF OTHER DEPARTMENTS

In his memorandum, the Chief of Engineers states that "although practically every department and almost every bureau of the Government has at times engineering activities or does construction work, yet these works are invariably incident to the primary functions of these various agencies."

Issue is taken with this statement. The primary function of the Army, for example, is its efficiency as a fighting machine. The improvement of rivers and harbors, the survey of the Great Lakes, the erection and management of public buildings in the District of Columbia, have no more relation to this primary function than have the paving of streets or the building of bridges in our large cities.

Where there is any engineering or construction essential to the military or naval functions of the Army or Navy, the proposed plan

herewith does not contemplate any change. The building of barracks and quarters, the erection of fortifications—all construction work clearly pertaining to the Army—is to be left with the Army. The construction and operation of dry docks and machine shops—even the building of barracks and quarters for naval forces, are to be left with the Navy. In no case does the proposed plan take away from these services any construction which fulfills any primary function in our National defense.

But the great bulk of our public works, other than those pertaining to National defense, rarely bear a close relationship with the departments under which they are at present. What relationship, for example, has the design, construction and management of our thousands of public buildings with the primary function of the Treasury Department?

In the many cases where portions of our public works are managed by departments whose primary functions unmistakably lie along different lines, these works are severely handicapped. They are “step children” and their interests are largely neglected. In such cases there cannot be the efficient and economical management of these works which is so essential for stopping the waste of public funds. The multiplicity of services, bureaus, commissions, etc., in each of our Government departments so scatters the energies of the departmental heads, as to increase their work and diminish their efficiency in an almost geometrical ratio.

SPECIALISTS FOR SPECIAL WORK

The Chief of Engineers tries to emphasize the divergence of the various specialties into which the modern profession of engineering has developed, with the effort to show that work along the line of one engineering specialty should not be performed by an engineer who is a specialist in a different line. Preferably each engineering activity should be performed by engineers who are specialists in that activity, but that all the more emphasizes the importance of not having engineering activities controlled by people who are not engineers at all.

The Chief of Staff of the Army, the Director of Operations of the Navy are not engineers, and do not assume to be. Neither are the higher officials of the Treasury Department; and yet as matters now stand these officials have a controlling influence over the various public works in their respective departments, and in the conduct of these works regulations have to be complied with, and methods followed which are primarily adapted to activities of a totally different character.

While an architect would not be likely to be the best man who could be selected for the management of a large survey, he would unquestionably be better fitted for such work than some military commander or than some Collector of Internal Revenue; and even if such an architect had been specializing on the construction of monumental buildings, he would undoubtedly be better able to undertake the wholesale construction of inexpensive dwelling houses, than would officials who had no technical knowledge of architecture.

While the modern profession of engineering has, like every other profession, developed along a number of specialized lines, all these lines have a common groundwork, bear a noticeable relation to each other and have many points of contact. There are many specialties in law and medicine. Certain attorneys, for example, have specialized in real estate law. While such a man might not be the best who could be selected to

try a criminal case before a jury, is there anyone who would prefer to select a physician for that purpose instead? Would not the ordinary general medical practitioner be better fitted to perform a surgical operation than the best lawyer at the bar?

Now if all the engineering activities of the Government, which are not directly incidental to the primary functions of the Government departments in which their management now lies, were consolidated into a single Department of Public Works, such a department would necessarily contain engineers, each of whom would be an expert along some special line. All the various engineering lines would be represented among these specialists. In doing this the Government would be doing no more than following a fundamental policy of universal application in the business world. The executive of such an organization of engineers could always select a man therein who would be specially suited for any work which might be at hand. Action would be direct and immediate. There would be no delay and lost motion, such as now often results when selection is governed by departmental reasons superior to the economic interest of the work itself.

In addition to interchangeability of personnel, there would result a corresponding interchangeability of plant and equipment. This would result in great economies as compared with the present situation in which each of the many existing organizations endeavors to keep itself fully equipped at all times, regardless of the amount of equipment which may be in the hands of other Government organizations.

The Chief of Engineers takes the stand that the department which uses any building or other structure is for that reason the best fitted to supervise its construction. As well say that every man who wears clothes should be his own tailor. Every man who buys a suit will make selection in accordance with his financial ability, his needs and his taste, but if he is wise, he will leave the cutting, fitting and sewing of the garments to a man who knows that particular business.

It would be inconceivable, in the construction of a public building, that the department which was to use that building should not be fully consulted as to its essential requirements, but the resultant building would be a better structure and would cost less money if constructed by an agency experienced in construction work and not unduly influenced by other considerations.

In this connection, it should be noted that practically all of our cities have their departments of public works, and that many of our states have also organized similar departments when their construction work has grown to any considerable volume. How much more necessary, therefore, is such a department for the National Government whose annual expenditure for engineering purposes has now become so great an amount. By adopting this policy the Government will be following the example already set by the government of every large country in the world.

CO-OPERATION ALONE INSUFFICIENT

Why should the charting and mapping work of the country remain scattered among so many different organizations—the charting of our sea coast by the Department of Commerce, of our lake coast by the War Department, the collection of charts of foreign coasts and additional surveys thereof by the Navy Department, the staking out of our public

lands by one organization in the Interior Department, and the general mapping of the interior of the country by another in the same department. Such multiplicity of organizations for kindred purposes unavoidably causes duplication and requires a much larger number of employees and much more equipment than if all this work were consolidated in one organization with two divisions, one for the land work and one for the water work. The equipment required would be somewhat different, but the personnel could be used interchangeably, as the judgment of the head of the organization might direct, and without the delays which would inevitably result from a series of interdepartmental conferences every time some measure of co-operation seemed desirable.

The Chief of Engineers feels that a full degree of co-operation is all that is necessary to accomplish economical results in this direction. Such co-operation, however, has been tried many times and has generally failed. Some fourteen or fifteen officials, each representing a different governmental survey agency, were convened as a Board of Surveys and Maps by order of the President on December 30, 1919, under instructions to adopt a workable plan of co-operation. The member who represented the Corps of Engineers, an Army engineer officer, was selected as the chairman of the board's committee on "co-ordination." Twice since then has this officer presented reports for the consideration and action of the board, and on both occasions the reports were referred back to to this officer's committee because they did not accomplish the obvious purpose of co-ordination of mapping activities. As a result, no practical system of co-operation has been found, and the matter remains in the same chaotic state as it was before.

It is the same with nearly all of our Government engineering activities; a consolidated organization would perform the essential work better than is now possible, would reduce personnel and equipment, and would save to the Government many millions of dollars annually in a way in which no mere co-operation can accomplish.

LAWS AFFECTING NAVIGABLE WATERS NOT TECHNICAL

Another point made by the Chief of Engineers concerns the enforcement of the various laws affecting navigable waters, which he regards as highly technical in character. The extreme technicality of these laws is not clear from an engineering standpoint. They are of a kind for the enforcement of which the qualities of vigilance, common sense, and attention to business are the prime requisites. Occasionally some technical knowledge such as the law of flow of water, etc. is necessary; but all such problems require engineering knowledge in their solution, and have no relationship whatever to military affairs. The Corps of Engineers has been handling these matters for years, and the noteworthy lack of any standards of dimensions for bridge clearances, as well as for the length and breadth of locks, does not indicate such attention and foresightedness on the part of that Corps as to justify its claim to superior fitness in this respect. Such variations as are frequently noted in the policies applied to these measures seem to result from the frequent changes in the personnel which handles them, and these changes seem to have become an essential feature of Army policy.

SCHOOLING OF ARMY ENGINEERS ON CIVIL WORK NO REAL HELP TO ENGINEER ORGANIZATION IN FRANCE

The Chief of Engineers dwells very strongly on the importance to the Army resulting from the schooling which Army engineers obtain in the management of the various civil works which have been entrusted to them. He makes the point that without such schooling there would have been much greater delay, expense and loss of life in France than was actually the case there with our forces. He by no means proves this statement, and there are many reasons which bring its accuracy into question.

There are many regular Army engineers whose work in France is entitled to the highest praise. Some, of course, never should have been sent there. The same statements are true with regard to the great many civilian engineers who entered the Army temporarily during the war. The Chief of Engineer's point, however, concerns the effect on the military engineering organization in France of the schooling which some of the regular army engineers had previously had with our civil works.

Now in all fairness to the individuals concerned, there is much which indicates that the regular engineering organization, so far as that organization functioned in this matter, was as often an obstacle to the work in France as it was an aid in its execution. Much of the success achieved by many of the regular army engineers who were in France was due much more to their ability to get favorable action at headquarters where they knew the ropes and could obtain a hearing, than to any previous schooling which these men had had with civil works.

The engineering work of our Army overseas was enormous. If the engineer organization of the Regular Army had fully profited by its previous experiences with civil works, it is unquestionable that all of our engineering activities in France would have been actively managed, under the Commanding General, by the Chief Engineer on his staff. But, on the contrary, this engineering work soon became more or less detached. Much of it was in effect taken out from under the charge of the Chief Engineer and placed under separate management—often with a temporary officer at its head—a civilian engineer, who was with the Army solely because of the war. In the general case those officers, regular and temporary, who were the most successful in engineering work in France, were those who in one way or another had succeeded in getting their work practically out from under the Chief Engineer, and who were able to manage it, under the Commanding General, without interference on the part of the Chief Engineer, or of the Regular Army engineering establishment in the United States.

The railroad service, the chemical warfare service, the purchasing department, the construction and operation of the ports, the construction of many of the cantonments, hospitals, etc. all illustrate this. They had to be gotten away from the red tape and endless restrictions and delays of the regular Army engineering organization in order that results might be obtained. While individuals among both the regular officers and the temporary officers were entitled to credit for much of the success obtained, it is by no means clear that the Corps of Engineers as an organization is so entitled.

The wide acquaintance of the officers of the Corps of Engineers with the engineering profession generally was not nearly so much in

evidence as the much narrower acquaintance among such engineers which was had by the few Army engineers who happened to be in power in Washington at the moment; and the many unfortunate changes of engineers in France, whose assignments did not accord with their special qualifications, and which changes were more noticeable with the engineers than with any other branch of the service, were the result of the narrower acquaintance and personal prejudices of the small number of Army engineers who alone had the decision in such matters in the early days after our entry into the war.

Much of this would have been inevitable in any case; but the point is that the Corps of Engineers as an organization by no means has the right to claim any major part of the credit for such engineering successes as were achieved in France, and cannot properly use such an argument in favor of its retention of civil works which are in no way incident to the primary functions of the Army.

OBJECTIONS TO CONTROL OF CIVIL WORKS BY ARMY ENGINEERS

On the other hand, there are many objections to the continued control of civil works by the Army engineers, which far outweigh all of the arguments of the Chief of Engineers if the many engineering activities of the Government are to be so conducted as to get a dollar's worth of result for every dollar expended.

Such civil works as are still performed by the Army engineers were assigned to them at a time when these officers were the only engineers in the employ of the Government. That this assignment has been undisturbed for over a century in no way proves that it ought to continue. Since that early time the modern profession of engineering has become established, and has increased and is still increasing in membership and usefulness in a manner without precedent. Our first technical schools were not started until about the middle of the Nineteenth Century, and the American Society of Civil Engineers—our parent engineering society—was not founded until 1852.

A number of engineering organizations have been established from time to time in the various Governmental departments, and the officers of the Corps of Engineers are no longer the only engineers in Government employ. In fact, they have become a decided minority, as the Government today pays for the services of more civil engineers than any other employer in the country.

The officers of the Corps of Engineers of the Army have usually been men of high personal character, and their administration has generally been free from graft and from dishonest or partisan motives. These are valuable qualities which the members of every organization should have. The Corps of Engineers of the Army, however, has no monopoly in this respect. Without in any way detracting from the personal character of its officers, it is manifest that their standing as officers of the Army, and their immunity from discharge except after due trial by a court martial composed of their seniors, have had much to do in the past with their ability to make reports to Congress which were unaffected by dishonest or partisan motives.

GENERAL STAFF OF ARMY IN CONTROL

In recent years, however, a change has become apparent. The Corps of Engineers, formerly practically independent in its administration

tion of the civil work in its charge, has come under the control of the General Staff of the Army. This General Staff is mainly composed of officers from other branches of the service and concerns itself solely with the efficient management of the Army as a fighting machine, not at all with the efficient management of the civil work which still remains under the Corps of Engineers. The control over the Corps of Engineers which the General Staff now exercises, while presumably necessary for army purposes, has very greatly destroyed much of the former efficiency of the Corps of Engineers in administering its civil work.

FREQUENT CHANGES OF STATION

An excellent illustration of this lies in the frequent changes of station of engineer officers in recent years. It is obvious that every change in the administrative head of an engineering district is necessarily followed by a period of uncertainty and vacillation on the part of the new administrator,—lasting until such time as he can pick up all the threads, familiarize himself with the personnel under him, and with the market conditions and resources of the district. During such period there is much unavoidable lessening of efficiency, much vexatious delay and much loss of money which could otherwise have been used for more desirable purposes.

Changes of such officials, of course, have to be made at times, but in recent years it has been the rule, as a result of General Staff control, to confine an officer's stay on a station to a maximum of four years. This has really meant an average of less than three years. As a matter of fact, there are few officers who are not moved once, and some who are moved twice or more, by each successive Chief of Engineers during his usually short tenure of office.

It is difficult for an officer of the General Staff to understand that these frequent changes mean in the aggregate a large waste of money to the United States. Such an officer feels that a Colonel of Infantry, for example, will be able to perform the duty of commanding a regiment as efficiently in Alaska or the Phillipines as in the United States. Wherever such an officer is sent, the duties of commanding a regiment remain much the same; and it is hard for a General Staff officer to appreciate that this is by no means the case with an engineer officer who is in charge of civil work.

On this civil work there is not only much variety, but much of it is of such specialized character as to require years of study and experience if really efficient management is to be had. The design and construction of harbors, open channel improvement of rivers, design and construction of locks and dams, survey and charting of navigable waters, the erection of large public buildings—all of these things are engineering specialties.

No man, however able, can newly take charge of such matters without making many mistakes, causing many delays, and wasting much money, however, honestly he may have spent it,—and yet with the present management of the Corps of Engineers of the Army, new men are being given just such assignments at least every three years on all of the work in charge of that Corps, and there can be no change in this respect so long as control remains with the General Staff.

RESPONSIBILITY CANNOT BE FIXED

In addition these frequent changes of Army engineers make it unlikely that one of them who had prepared plans and estimates for a work of

any magnitude will remain in the district long enough to perform its actual construction. This latter would be done by one or more of his successors. If these successors should exceed the original man's cost estimate, they would declare that that estimate was too low, and that they had had nothing to do with the making of it. The original man might be certain that the estimate was sufficiently large and that its being exceeded was due to faulty engineering or faulty business management. Neither side to such a controversy, however, could prove his case, so responsibility could not be fixed and the Government would have to pay the cost. The engineer who makes an unduly low estimate or who causes the work to be unduly delayed or to exceed in cost what was a proper estimate, should be brought to book in some way, and such facts should be held against him on his record. The frequency with which Army engineers are changed, however, renders this practically impossible.

Engineers, as such, have no right to question the military necessity which may exist for these frequent changes of station. That they are disastrous for the efficient and economical conduct of the civil works, however, is undoubted. The sole remedy for this difficulty lies in taking these civil works away from the Army engineers, and placing them under civilian control where military reasons of a compelling character can no longer adversely affect them.

ARMY AT LARGE FAVORS CHANGE

The Army itself, outside of its Corps of Engineers, will in the main approve of such action, and will feel that the strictly military engineering work thereafter remaining with this Corps will be the better attended to with resultant benefit to the Army as a whole. Col. Roger D. Black, formerly of the Corps of Engineers and of the General Staff, while personally disagreeing with the conclusion, admitted in a discussion before the American Society of Civil Engineers that:

"It is believed that there is a not inconsiderable opinion in the General Staff to the effect that the river and harbor work is detrimental to the interests of the Army, that the Corps of Engineers should be relieved from this work and devote its entire time to 'soldiering'."

France, Italy and Germany are essentially military nations. The people of each of these countries realize that the efficiency of the Army is the prime essential Government function. No chances are taken; and yet in none of these countries—not even in England which is not so essentially a military nation—does the engineer organization of the army have charge of the country's civil works. If there were any real increase of efficiency in such civil engineering schooling for its army engineers as would result in improving the country's military strength, such countries as these would never have overlooked such an opportunity. The conclusion is unavoidable that the "military" argument for the retention of our civil works by our army engineers proceeds more from intrenched tradition and long established custom than from the true interest of our National defense.

SCHOOL TRAINING ALONE DOES NOT MAKE ENGINEERS

There is another reason, however, why these civil works should be taken away from the army engineers. These latter are originally appointed to their positions either from the United States Military Academy at

West Point, or are chosen by examination from recent graduates of our various technical schools. The training at West Point brings forth many valuable qualities of great importance not only in the army but in all other walks of life. In purely educational matters, however, the strongest emphasis there is placed upon mathematics. So far as the studies go, West Point is essentially a mathematical school. The mathematical faculty is very important for a soldier and essential for an engineer, but in itself alone it will not suffice for either. While an engineer must have this faculty, there are many other necessary qualifications.

In the broader sense of the term, an engineer, like a lawyer or physician, or any other professional man, must be born as well as made. The officers of the Corps of Engineers of the Army are for the most part selected from those who have made the best records in the course of study at West Point. As a result, our Army engineers are, as a class, gifted to a greater or less degree with the mathematical faculty. They are by no means all of them engineers in the full sense of that term. In fact, it is doubtful if more than a third of them are really engineers in the sense in which that expression is understood by the profession generally.

To a degree the same statement holds good for the graduate of our engineering schools. They have the ground work—as a rule a better technical ground work for the purpose than can be given at West Point—but they have yet to demonstrate their industry, ability and capacity along engineering lines and to make good in the profession.

No school, however excellent, can in itself make an engineer in the full sense of the term. It can at best give but little more than the technical ground work. West Point hardly does that, as its course of studies does not attempt to do more than outline the field of civil engineering. For army engineers there is an additional post graduate course of about two years at the Engineer School at Camp Humphreys, Va., but such practical instruction as is given there is more military than civil.

In addition to the ground work provided by the schools, a man to become a real engineer must actually practice the profession, must personally make designs, must personally take charge of construction, and must demonstrate by his work, conducted over a period of years, that he can obtain the efficient and economical results which alone can prove his right to be a professional engineer in the true sense.

By no means do all graduates of technical schools pursue engineering practice. Many in civil life become deflected to other activities and drop out of the profession in one way or another. With the Corps of Engineers of the Army, however, the great majority of its younger officers remain and are given large engineering responsibilities regardless of the results which they accomplish. The result is much of a character with what we would expect if the selection of all of our federal judges was based solely upon their records as undergraduates of a few of the law schools of the country.

GENERAL ATTERBURY'S TESTIMONY.

No man is better qualified to give an opinion in this respect than is Gen. W. W. Atterbury, operating Vice President, Pennsylvania Railroad Co. In addition to his wide engineering experience with that organization, he was, during the recent war, in charge of transportation with the American Expeditionary Force in France, and from that work derived an

unusual opportunity to form an opinion regarding the Corps of Engineers and its work.

Speaking before the Senate Committee on Military Affairs on August 27, 1919, relative to Army reorganization, Gen. Atterbury stated:

"Now, the Corps of Engineers. From the standpoint of the Army it is a mistake to take 'the cream off the jar of milk' and put them in the Engineer Corps. Then you send them off to a school, after which the engineers are put out on civil work. The result is that you have produced neither engineers nor soldiers. That is perhaps a little exaggerated, but I say that they are not engineers because when out on general work their work is done by civilians. The work ordinarily done by the Corps of Engineers under the Treasury Department, buildings and river and harbor work, should be done by a civilian organization under a civilian department. The military engineering work, should be, of course, under the Corps of Engineers. I do not believe you ought to take the best men in the class, the men who stand highest in the class, for that purpose. The best engineer is not always the highest standing man in the class."

CIVILIAN ASSISTANTS POWERLESS TO PREVENT MISTAKES.

Many of the younger officers of the Corps of Engineers of the Army are kept so much on duty with troops or on other strictly military work that when they first take administrative charge of a district which is doing purely civil work, they have had so little personal practical experience along civil engineering lines that delays and expensive mistakes are unavoidable.

The civilian engineers who are attached to the Army in such districts cannot control the situation. They are subordinate to the new and often inexperienced Army officer who arrives to take charge of the work. This latter may be fresh from military duties, and, like many Army officers, he may be strongly imbued with the idea that a subordinate has no right to make suggestions even remotely indicating a lack of belief in his chief's infallibility. By snubs and otherwise, he may discourage suggestions, and the civilian engineer can do nothing but remain silent. His continuance in office, his bread and butter, largely depend upon the whim of the officer. He has no right to go to anyone else in the matter. To go over the officer's head would be insubordination. "Steering the boss" is a dangerous game at best. Civilian engineers have to be very careful in such matters. The efficiency of an established and well organized district can easily be destroyed in a short time by a few such assignments.

The effect of the present system has become so far reaching that civilian engineers as a class have schooled themselves into suppressing their real views if they believe them to be in any way contrary to the ideas of a new officer. As a result, an Army engineer, to obtain their real views must first cultivate the most friendly and intimate personal relations with them. Unfortunately few Army engineers will do this for fear of being accused of lack of "discipline".

There is no escape from situations of this character unless all civil work now under the Army engineers is taken over by an organization composed of men who have proved themselves to be competent professional engineers by long years of successful practice. As matters now are, the civilian engineers are essential to the successful management by an Army

engineer of the work of a district, but on the other hand, they are powerless to prevent its mismanagement by him if he displays any reluctance to listening to them.

PERSONAL RECORDS OF ARMY ENGINEERS SILENT AS TO THEIR ENGINEERING EFFICIENCY

There is a side light on matters of this character which should not be overlooked. The Army, under the supervision of the General Staff, keeps personal records of all its officers. In the case of officers of the Corps of Engineers these records of the General Staff are usually expressions of opinion on the part of senior officers, and rarely contain any statements of fact. Strange as it may seem, in the case of no engineer officer does this record contain any information whatever as to the results which he has been obtaining along engineering lines, nor does it show whether his work has been economically performed or not. Such matters appear to be devoid of interest for the Army authorities.

The result of this is that an Army engineer who has charge of civil work need concern himself with little but the paper work and the social activities of the locality. So long as he can so conduct the work itself as to keep official complaints from being made, he gets by with a good record, regardless of whether his work has been unduly delayed or has cost much or little. An agreeable social connection, and a competent clerical force to look out for the multiplicity of difficulties with the papers—those, and not the engineering results, seem to be what is chiefly desired.

CLERKS THE MASTERS AND NOT THE SERVANTS

And this very fact underlies and causes most of the mass of complicated paper work which has grown in recent years to an unprecedented magnitude. The district officers, changing as frequently as they do, lean heavily upon their clerks. These clerks find they can conduct their offices best by satisfying the clerks in Washington. The latter, practically being fixtures at headquarters there, finding that they can have pretty much their own way in such matters, and being in touch with the clerks in other branches of the Army, keep adding clerical requirements, and boosting the game. The paper work has finally become so complicated that it requires specialists to handle it. Men who become such specialists find that it is then easier to hold their jobs. They stick on and keep adding to the requirements to such extent that additional clerks have to be employed not only in Washington but by all the district offices, and so the clerical game goes merrily on, with officers and civilian engineers doing their utmost to keep up with it, and with the real interests of the work in the field becoming more and more neglected. The knife is the only remedy for such a disease—cut it all out and start fresh. Put real civil engineers in charge of this civil engineering work and the clerks will become servants and not masters, and real economies will then become possible.

UNDUE INFLUENCE OF ARMY POLITICS

So long as an Army engineer's personal record at Washington is silent as regards his engineering achievement, manifestly his work along such lines will not receive the attention from him which it would were his promotion and preferment based upon his success with it. He finds that

by satisfying the clerks, and maintaining an acceptable social standing, and especially by getting himself into the personal good graces of his immediate superiors, he can obtain the promotion and preferment which should be based solely upon his engineering accomplishments.

By playing the game of army politics, also, he finds that even his engineering failures, if not too notorious, will be disregarded. Is it any wonder that real engineers among the officers are overlooked, become discouraged and in some cases quit in disgust? Where preferment depends upon army politics and not upon engineering efficiency, is it any cause for surprise that the works suffer, that delays are the rule and not the exception, and that millions of dollars are wasted?

UNDEMOCRATIC CASTE SYSTEM

Again, why, in a democratic form of government, should we have a class of employees who can be promoted so far and no further regardless of their conduct and efficiency?

Such a class is formed by the civilian engineers employed under the army engineers. After years of experience and the accomplishment of excellent results, the best which one of these men can hope for is to become principal "assistant" engineer of a district with a salary ordinarily not exceeding \$250 a month, with, in rare cases, a maximum slightly greater; and with the duty of guiding the newly arrived and often inexperienced district officer under whose orders he is placed—so that expensive mistakes may be kept at a minimum.

Of course, such a man can quit and seek employment elsewhere. Many of these men do, and the Government has lost the services of many excellent engineers in just this way; but many also have given so much of their lives to the Government, have so made the Government's interest their own, and the work has become so much a part of them, that they remain regardless of the feeling that they are held in a sort of lower "caste" from which under our laws there is no present way of promoting them. Is it necessary to say that a system savoring so essentially of "caste" is contrary to our basic American principles, and would not be countenanced by the people did they fully understand the situation.

But apart from that feature of the case, it is contrary to the essential principles of good business management to have a class of employees in an organization who are held as ineligible for promotion beyond a certain point, and who can never aspire to the highest positions. It should be possible for the humblest employee of an organization to attain its leadership if he makes good.

SUMMARY OF OBJECTIONS

Concrete cases in proof of these assertions can be produced. They could be produced plentifully if officers on the active list and civilian employees dared to risk their positions and give their honest views freely.

What can be clearly established can be summarized as follows:

(a) Army engineers are not all engineers in the full professional meaning of the term. Probably not over a third of them possess the necessary qualifications.

(b) The constant changing of station of Army engineers—such a

change occurring on the average in a period of less than three years—prevents these engineers from efficiently handling their work and leads to vexatious delays and to great waste of money.

(c) Delays are the rule and not the exception.

(d) The constant changing of station of Army engineers renders it unlikely that the same man who makes an estimate for a work of magnitude will actually construct it. Responsibility for excess cost and waste, therefore, cannot be definitely fixed.

(e) The civil engineering work of the Corps of Engineers is regarded by most of the rest of the Army as time and energy wasted, and experience and skill in this work, instead of helping in the advancement of an officer, becomes a bar to his promotion.

(f) Promotions and assignments of Army engineers depend on army politics and not upon engineering efficiency.

(g) No one in the War Department cares very much about the civil engineering work of the army engineers or takes any real vital interest in it.

(h) No one in the War Department cares whether one of these civil works costs a million dollars or so more or less than it should.

(i) The personal records of officers which are kept by the General Staff of the Army contain no information with respect to Army engineers which shows what they have or have not accomplished in the way of efficiency or economy.

(j) There is a general exaltation of paper work. The clerks are the masters instead of being the servants. The papers in a case are held as being of greater importance than the case itself.

(k) Civilian engineers who assist an Army engineer are essential for the successful performance of any work by him, but on the other hand are powerless to prevent faulty engineering or faulty business management on his part, should he not desire to listen to them.

(l) There is a distinct, unAmerican and undemocratic caste system. A civil engineer employee of the Army engineers can be promoted so far and no farther. He becomes subordinate to officers much younger than himself and must try to save them from the results of their inexperience.

(m) There is a general insufficiency of inspection of the work in the field; and headquarters at Washington is in very inadequate touch with conditions. Nobody seems to care so long as the papers are straight.

All these defects would be remedied once proven engineers were placed in responsible charge of the Government's civil engineering works, under a department whose sole reason for existence was the efficient and economical conduct of such works. These civil works would then cease to be side issues scattered among various departments whose chief concern lay in other directions. Clerical work and Army and other kind of Washington society politics would then cease from being controlling factors. Engineers would be judged upon their actual achievements in engineering lines, and would be promoted, and rewarded accordingly. There is no other answer than to put all the Government's engineering work under real engineers and have it conducted by a Department of Public Works.

WHAT A DEPARTMENT OF PUBLIC WORKS SHOULD AND SHOULD NOT INCLUDE

Such a department should not include engineering activities which are clearly incidental to the primary functions of the National defense.

The construction of fortifications for the Army; the operation of dry docks and machine shops for the repair of our naval vessels; the obtaining of military information to be placed on maps for the use of the Army; the building of barracks and quarters and incidental municipal improvements connected therewith for our Army and Navy forces. Such things—being directly in line with the primary functions of the Department concerned, will receive the full thought and attention of those departments and can be safely left to them.

But the general mapping of the country and its coasts; the improvement of its rivers and harbors, and their marking and lighting; the construction, repair and management of the thousands of Government buildings, many of which are available for the use of all Government departments; the building of roads and railways so far as the Government undertakes this work in a direct and permanent manner; the reclamation of our arid lands, and the leveeing and draining of our extensive swamps and overflowed areas; all of the Government's activities, in short, which are not directly incidental to the National defense, and in which three-fourths or more of the expenditures involved are along lines which are included in the modern profession of engineering; these, for reasons of efficiency and economy, should be consolidated into one Government Department of Public Works.

GREATEST OPPORTUNITY FOR IMMEDIATE GOVERNMENT ECONOMY

Now, in any reorganization of the Government's activities, the creation of such a department of Public Works offers the greatest immediate opportunity for a reduction in Governmental expenditure.

The cost of our Army and Navy with their resultant pension list, etc., of course, forms the major part of our annual expenditure. The people are already restless under the heavy taxation which such expenditure necessitates. Our main economies in the future unquestionably will lie in reducing, so far as may be possible, the costs of these establishments for our National defense.

The necessity for safety and security is, however, of prime national importance. Our Army and Navy must be adequate for our defense. Any other course is in no sense an economy. Our wounded and disabled soldiers and sailors should be our first care, and should never be neglected. But the size and therefore the cost of our Army and Navy are chiefly dictated by considerations from without the country, which are by no means always under our own control. These establishments should be as small as is consistent with a certainty of safety and no smaller, and they should, of course, be kept at the highest degree of efficiency.

Considerations solely connected with the interior development of the country, and with the increase of its commerce and prosperity, cannot, in themselves, be allowed to control Army and Navy policies; but such considerations should control most of our other governmental activities, and among these there are none in which so great savings in dollars and cents can be made as in those which concern the engineering profession.

Engineering has been well defined as the science of economy—economy usually measured in money, but occasionally, during war or other emergency, measured in time—but economy nevertheless. An organization to practice a profession whose motto is economy should be composed of men who had proved that they had themselves made economies and were therefore the more likely to continue making them. The Government is entitled to the best, and it can get the best, but selection should be made from those known to possess the desired qualities and not otherwise.

WORKS INCLUDED

The various engineering activities which it is desired to consolidate and place in this new department are the following:

(A) All public buildings, structures and grounds except those required by the Government of the District of Columbia and those required solely by the Army and Navy for distinctly military or naval purposes.

(B) All river and harbor and related works, including the Mississippi River Commission, the California Debris Commission, the Federal Power Commission, the Board of Engineers for Rivers and Harbors, and the supervision of the Port of New York.

(C) The Bureau of Lighthouses.

(D) All public roads, railroads and bridges built and maintained by the Government except those required by the Government of the District of Columbia and those required solely by the Army or Navy for distinctly military or naval purposes, but including the Bureau of Roads of the Agricultural Department, the Alaska Road Commission and the Alaska Engineering Commission.

(E) The Forest Service.

(F) The National Park Service.

(G) The Reclamation Service, including all irrigation, drainage and water supply and related works except those required by the Government of the District of Columbia and those required solely by the Army or Navy for distinctly military or naval purposes.

(H) The Coast and Geodetic Survey.

(I) The Survey of the Northern and Northwestern Lakes.

(J) The Hydrographic Office of the Navy.

(K) The Naval Observatory.

(L) The Bureau of Standards.

(M) The Bureau of Mines.

(N) The Geological Survey.

(O) The General Land Office.

In all of these it will be noted that the main activity of each is along engineering and technical lines and that three-fourths or more of the expenditures are for surveys and construction where engineering skill is essential to economy. The usefulness of none of these various organizations is by any means confined within the limits of the department to which it is now attached, but is very general and greatly concerns other departments and the general public as well.

The design and erection of the thousands of buildings constructed by the Government should be handled by one organization. The ordinary

operation of these buildings should be looked after by the department which uses them. Where more than one department uses them, their operation and repair could be managed by the Department of Public Works.

All of our governmental road and railroad activities should be united. The heaviest expenditures for the Forest Service and for the National Park Service are for the construction and maintenance of roads, bridges and buildings.

The work of the Coast and Geodetic Survey and of the Survey of the Northern and Northwestern Lakes, and to a great degree that of the Hydrographic Office of the Navy is along identical lines. The survey work of the Geological Survey and of the General Land Office is closely related to the survey work of these other organizations.

The Naval Observatory is essentially a research activity and is more closely allied to these various surveying activities than to anything else. The accurate determination of time, for general distribution to the railroads and the public, is essential in determining the astronomical positions of places throughout the country where accurate maps are to be made, and the Almanac or Ephemeris produced there is essential not alone for navigation, but for all important survey work.

The Bureau of Standards is not only essential for all accurate surveying work, but its duties and helpfulness would be greatly increased if its research and standardization work could be made automatically available for all the activities which it is proposed to concentrate in a Department of Public Works. The Bureau of Mines is closely related to the activities of the Geological Survey; and the Reclamation Service is essentially a general engineering activity throughout, with many points of contact with the other activities mentioned.

ONE-SIXTH OF TOTAL GOVERNMENT EXPENDITURES OTHER THAN FOR NATIONAL DEFENSE INVOLVED

The annual appropriation for these above named activities for the fiscal year ending June 30, 1921, was \$107,830,024.07. The total appropriation of the Government for that same period was \$3,213,042,484.68. Of this latter \$2,553,397,028.60 was for interest on the public debt and for Army, Navy, pension and allied military purposes, so that the strictly civil engineering activities of the Government formed about one-sixth of all of its appropriations other than those for interest on the public debt and for national defense.

Here unquestionably is the main field for immediate Government economy; and the consolidation of these engineering organizations into one department and having them under the control and management of proved engineers will at once make for their increased efficiency, will reduce personnel and equipment and will stop waste.

CLASSES OF WORK

These various works naturally fall into four general classes:

1st. Surveys and Research.

2nd. Public Buildings and Grounds.

3rd. Works of Reclamation, including irrigation, flood protection, drainage, etc.

4th. Works primarily concerned with transportation, including bridges, roads, railroads, canals, waterways and aids to navigation.

The volume of work involved is very great. The activities named are all such as require technical knowledge and skill, and are included within the present profession of engineering.

CONSTANT WATCHFULNESS ESSENTIAL TO STOP WASTE

Clearly all such activities should be in the charge of the same government department. Unless the large volume of work involved can be so consolidated, it will be exceedingly difficult, if not impossible, to apply the principles and methods used by business organizations in order to promote efficiency.

It is solely by such consolidation that that constant watchfulness will be possible which is so essential for the elimination of useless and undesirable activities and the proper co-ordination of useful ones.

As the needs of the Government in such directions keep varying from time to time, such watchfulness is necessary to prevent duplications of work, and to keep forces and equipment at a minimum. In this way alone can there be provided that constant effort to "make a dollar go the farthest" which has been well stated to be the duty of the engineer.

POSSIBLE CONVERSION OF EXISTING DEPARTMENT

It may well be that in any general reorganization of the Government's executive activities, the work of some departments would be unduly diminished and the work of others would be unduly increased. It is possible, therefore, that the duties now proposed for a Department of Public Works could best be given to one of the existing departments whose duties would otherwise become too little; and the suggestion to put these public works into the Interior Department, possibly changing the name of the latter, would have the added advantage of rendering unnecessary an additional department and an additional cabinet member.

VOLUME OF WORK NECESSITATES SEPARATE DEPARTMENT

In any event, however, these various engineering activities should be brought together, and the volume of work and expenditure involved is so great as to justify a separate department with a cabinet officer at its head whose primary function would be the efficient and economical management of these works and the elimination of waste.

SECRETARY, ASSISTANT SECRETARY AND LAW OFFICER

At the head of such a department there should, therefore, be a Secretary who is a member of the Cabinet. There should be an Assistant Secretary and also a legal adviser or Counsellor, specially versed in the law of contracts, riparian laws and kindred subjects. These officials should all be specially appointed by the President in order that they may be certain to be in full harmony with him

ADVISORY COUNCIL

For matters of general departmental policy it would be well to have an Advisory Council composed of prominent business and professional men, specially selected by the President, whose expenses should be provided for, but who should serve without pay. The Secretary of the Department, its law officer, and the head of its permanent technical force should all be ex-officio members of such an Advisory Council.

CONTROL OF GENERAL POLICIES

Through these officials and instrumentalities the President and the Department, and through them Congress, will be able to keep in touch with the best thought in the outside business and professional world, and will have that complete control of general policies which is essential to the carrying out of the will of the people.

PERMANENT TECHNICAL FORCE

There is a great amount of work involved in such a department, however, which is essentially technical in character, which therefore requires the services of experts, and which will be much the same regardless of such changes as may occur from time to time in matters of general policy.

For work of this character there should be a permanent organization by which is meant one whose membership is not subject to sweeping changes, political or otherwise, and which will function with continuity, preserve essential traditions and develop an esprit de corps.

For this permanent technical force there should manifestly be one chief executive or Director General. Under him there should be a Director in special executive charge of each of the main bureaus into which the work of the department would naturally be divided. This would require one Director General and four Directors.

The work of each bureau, under its Director, will divide along specialized lines. Each bureau will logically be composed of two, and sometimes more, divisions. Each such division should have its Chief.

TWO METHODS OF OBTAINING SUITABLE MEN

Now in the organization of the permanent technical force there are two general methods which may be applied.

HIGH SALARIES

One method, that usually applied by large business organizations, is one of large monetary compensation. Some corporations pay salaries to their engineering advisers as high as \$50,000 or more a year. The interests of such corporations are definite and are unaffected by extraneous considerations. It pays them to get the best advice possible and they get it.

The Government, however, cannot follow such a course. Congress will never consent to the payment to Government employees of the large salaries which are customary in the business world. Nor, if it did, would

there be any likelihood of the Government's keeping such highly paid positions filled with the men of special ability who alone could earn such salaries. Too probable would be the eventual giving of such appointments as rewards for past political services, too improbable would be the giving of such appointments to qualified specialists whose action in the interest of the Government might often have to be contrary to the immediate popular or political desire.

LOW SALARIES

But the Government can obtain the services of properly qualified men without large monetary compensation in a way which is not ordinarily open to large business corporations.

By such methods as pinning a medal or decoration on a man or otherwise increasing his dignity and standing as a reward for exceptionally heroic or distinguished service, the Government can often get more in the way of devotion to its interests than any amount of money could buy. This principle of increasing the dignity, honor and standing of individuals is universally applied in all organizations which have to do with War or other great emergency.

LONG ESTABLISHED PRECEDENT

And this principle, in essence, can be applied to a Department of Public Works in such manner as to secure the loyal services of competent men at salaries which Congress would consider reasonable. It is not a new departure, it follows a long established but not generally recognized precedent. It has been under trial for many years, and it has stood many tests.

Quite by accident, and in no way by design, this principle was adopted for the management of such of the public works of the country as were given to the Army engineers in the old days, at a time when they were the only Government engineers available.

While the work of the Army engineers has been open to many objections and has often been accompanied by delays and wastefulness, it has been conducted with the minimum of graft and the minimum of petty political partisanship. And this has been not so much because of the men themselves, but because they were given a high standing, were suitably protected in their positions, and could not be peremptorily discharged without real cause. It is the principle involved in this matter which should be preserved. It has worked so well for so many years that it should not go unheeded, but should be retained and adapted to our new conditions.

Such objections as have arisen to the Army engineers have never been by reason of this feature of their organization. On the contrary, it has been the recent weakening of the principle involved which has led to much of the criticism.

SECURE TENURE OF OFFICE NECESSARY

To apply this principle to the permanent technical force of a Department of Public Works, it will be necessary that the members of this force should be given as secure a tenure of office as is given to officers of the Army and Navy.

They should be irremovable except for just cause, and then only after a trial by a court or board of officers senior to them in the service, and who would therefore be unlikely to be influenced by selfish motives. Such a trial should be conducted in accordance with the rules of law, and the accused should be given a full hearing.

RANK NECESSARY

In addition to a secure tenure of office the members of this permanent technical service should be given as much in the way of standing and dignity as will place them on an equality with officials in other services whose responsibilities are of approximately equal volume.

This can be done by giving them appropriate rank—assimilated to corresponding grades in the Army, Navy, Coast Guard and Public Health Service. The titles used by them should be appropriate to their duties, but should be accompanied by appropriate rank, and their pay and allowances should correspond therewith. This course will lessen the possibility of these men being influenced by motives of an unworthy or partisan character and will render them as reliable for the disbursement of Government funds and for the safeguarding of Government property as are the present engineer officers of the Army.

There can be no objection to rank when it results from individual attainment and is not hereditary. In the character of organization which is desired the positions carrying rank should be few and should be capable of attainment by any of the civilian employees who make good. These positions will then offer a real and worth-while goal as a reward for efficient service.

SMALL NUMBER OF OFFICERS

The annual salaries in the aggregate of the officers of such an organization should not exceed, and preferably should be less in amount than the aggregate annual salaries now paid to the men in executive charge of the various engineering activities which it is proposed to consolidate. There is no necessity nor excuse for any increase in overhead costs in an effort of this character which is primarily designed to effect economies.

In giving to such officers a tenure of office as secure as is now given corresponding officers in the other services named, it will be necessary to provide for their retirement for physical and other disability, and for age, say at seventy. The heads of the various bureaus and divisions should be selected from among them by the President, but their promotion otherwise should be by seniority subject to an examination for fitness which should be conducted by a board of officers senior to them. Should one of these officers fail to demonstrate his fitness for promotion at such an examination, he should either be left in his previous position or retired from service at the discretion of the Secretary of the Department.

The slight expense which may result to the Government from such retirements will be many times offset by the knowledge that considerate treatment of this kind will be given to the officers. It will make these positions all the more desirable of attainment by the civilian employees, and will be a stronger incentive to these employees to perform work of the very best character.

There should be but a very few officers and but a small percentage of them will be likely to be retired for any cause other than age. The

security of their positions will enable them fearlessly to give the Government their honest views regarding matters referred to them, unswayed by motives of a petty partisan nature. It will mean much to Congress to be able to obtain views of such character.

These officers also will still have a strong incentive to perform their work with the maximum of efficiency because of the selection of the Chiefs, Directors, and Director General from among them. There will always be before each of them, the possibility of attaining these high positions if the work which they perform for the Government is of the right character.

It is fully realized that objection in many quarters will arise to the plan of creating a small commissioned force and of giving that force the control of the technical work of the new department. Perhaps all the objections which now apply to existing organizations will be felt by many to apply to this new organization. There is a very essential difference, however. The officers under this new plan would be so recruited that they will necessarily all be engineers. It is essential that they should be protected from petty political interference or the results may be disastrous, and the giving of commissioned rank to them and making them irremovable except for cause and after trial by their seniors is the only way by which they could certainly be given this protection.

SUBSEQUENT FILLING OF VACANCIES

The method of recruiting of this small commissioned force, as vacancies occur, should be by selection by a board of officers from among the civilian employees of the Department. These employees will all be men who have passed the requisite entrance and promotion examinations required by the Civil Service Commission, and will all have a civil service status.

By confining the selection of new officers to such of the civilian employees who have arrived at a reasonable age and who have worked for the Government for a reasonable period, it becomes not only possible, but inevitable, that the selection will be based on the work which such employees have performed and on the results which they have accomplished. The officers composing the board which makes the selection will necessarily be anxious to secure men who will be creditable to the organization and whose appointment will give it added strength. Selection will no longer be based solely upon school work or upon the passing of some special examination.

With vacancies filled in this way, two of the chief defects of existing organizations will be remedied. In the first place the men selected will be bound to be engineers in the full sense of the term, and in the second place there will be no longer any legal bar to the continued promotion of efficient engineers who are making good.

ASSIGNMENTS OF OFFICERS SHOULD NOT BE RESTRICTED BY LAW

It will be noted that with exception of the heads of bureaus and divisions the proposed plan makes no distinction as to duties between the various officers. Any of such officers should be legally available for detail to any of the work of the department. It is undoubtedly true, and highly desirable, that individuals among them will display special qualifications

for certain kinds of work. As proposed, there is nothing to prevent such individuals from being given the class of work for which they have shown themselves best fitted. It would be possible, of course, that an officer whose capabilities were best along surveying lines could be given architectural work—but this is not at all likely to happen, as it will manifestly be the desire of the executive officers in a department which deals solely with the public works, so to assign the officers as to secure the maximum of efficiency for the organization.

There is a real benefit, however, in not confining these officers by legislation to certain kinds of work. The knowledge which each officer will have that he is eligible for other classes of work than that in which he may at the moment be engaged will necessarily broaden his vision, will give the organization a better esprit de corps, make it more flexible, and will weld it into a more harmonious unit than would any permanent separation of the officers among the various bureaus and divisions into which it may be convenient to divide the department.

It will unquestionably be wise to leave all such matters to the higher officials of the department, as they can be depended upon to place the various officers where their work will be the most effective. Also this will do away with any incentive to the building up of one bureau or division at the expense of the others, and thereby perpetuating undesirable activities.

If for any reason, Congress should desire to slacken work along certain lines and increase it along others, this feature of interchangeability among the officers will cause the organization to respond, and there will be no inducement to build up certain branches of the organization regardless of the needs of the moment in other directions—efforts of which character could occasionally be quite annoying and embarrassing to Congress.

PRELIMINARY ORGANIZATION OF DEPARTMENT

For the preliminary organization of such a department it would be advisable to take over the existing organizations concerned with as little as possible of immediate change in their personnel. The logical course would seem to be first the selection of the Secretary, Assistant Secretary, and Counsellor of the new department and then, from among the various organizations which were to be consolidated, to select the Director General, Directors and Chiefs of the permanent technical force.

These men will know those who have previously been working under them, and will be able to advise which of these subordinates are the best fitted for preliminary selection for the limited number of officers of the new department.

There will be no difficulty if this method of selection is followed except possibly with those organizations which are to be taken from the Army and Navy. Here the officers now in administrative charge will continue to be needed for their regular military and naval duties; but there will be no dearth of material from which to make selection, as the civilian employees of these organizations, the Army and Navy officers who have been retired therefrom and who are not yet too old, and the officers still actively serving with them and who would be willing to vacate their present commissions if appointed in the new department, would offer a wide field for judicious selection.

By the pursuit of such a policy in the original appointments for the new department, there would result the minimum of shock and disturbance to the work in progress and the change could be effected without serious friction.

It would then become the duty of the Director General and the Directors of the new organization to determine all details regarding the consolidation of offices, districts, works, etc., throughout the country, and make pertinent recommendations regarding such matters to the Secretary. In a short time by such methods, it would become possible properly to reduce the personnel and introduce the maximum of efficiency and economy in administration.

OFFICERS IMMEDIATELY AVAILABLE FOR ARMY WORK IN TIME OF WAR

The Chief of Engineers of the Army is very insistent as to the necessity for Army engineers to become familiar with civil engineering by using our civil works as a school of instruction for them. It is believed that the fortification and other engineering activities left with the Army, together with the command and management of engineer troops therein, will offer all of the engineering schooling needed by these regular officers, will increase their usefulness for the Army itself and will not entail so many delays and so much wastefulness as do the present methods.

It is realized that modern war demands the services of nearly the entire engineering profession, and provision should therefore be made for the fullest use desired by the Army of the officers of this new department. They should be and can be as eligible for immediate detail with the Army in time of war or other emergency as are the present officers of Army engineers who are engaged on civil work.

But they will, for the most part, be specialists in various engineering lines, which is what Army engineers are not permitted to become; and, with their special talents, which, in each case, will be well known to the Government, they can be assigned by the Army to duties where these talents are needed, with as much, and probably with greater, success than was the case in France.

CONCLUSION

The plan outlined will create the new department with the minimum of shock or friction. It will preserve all essential principles and features of the older organizations. It will enable the new organization to adapt itself to the work which is to be undertaken, to put a stop to overlapping and lost motion, to bring about standardizations and quickly to reduce its personnel and equipment to that which is really required. It will free it from such regulations and requirements of other organizations as are not germane to its own work, and will create a corps of experts on which the country can depend for the efficient and economical solution of its engineering problems along the lines of such general policies as may be desired by the President and the people.



